

Torpedo 2023 Project Costing								
Type	Classification	Category	Expense	Sources/Notes	Qty	Amount per one	Total	
Re-used	Direct Material	Electronics	Joystick	PC Controller	1	\$12.50	\$12.50	
Purchased	Direct Material	Electronics	DC-DC Converter	48-12V 30A Output	4	\$28.00	\$116.00	
Purchased	Direct Material	Electronics	DC-DC Converter	48-12V 20A output	2	\$15.00	\$30.00	
Purchased	Direct Material	Electronics	DC-DC Converter	48-12V 5A Output	1	\$13	\$13.00	
Purchased	Direct Material	Electronics	ESP Microcontroller	Microcontroller	1	\$10.00	\$10.00	
Purchased	Direct Material	Electronics	Camera/ solenoids cables	Cables	1	\$4.00	\$4.00	
Re-used	Direct Material	Electronics	Motor Driver	Basic ESC	6	\$37.50	\$225.00	
Re-used	Direct Material	Electronics	Camera	IP	8	\$49.00	\$392.00	
Purchased	Direct Material	Electronics	Lights	UnderWater Lights	1	\$2.00	\$2.00	
Purchased	Indirect Material	Electronics	XT-60 Connector	Polarized Power Connector	27	\$0.67	\$18.00	
Re-used	Direct Material	Electronics	Ethernet Module	Communication Module	2	\$10.00	\$10.00	
Purchased	Direct Material	Electronics	Ethernet Switch	8 port-switch	1	\$22.00	\$22.00	
Re-used	Direct Material	Hardware	Tether	Power Cable 13AWG	1	\$18.00	\$18.00	
Re-used	Direct Material	Hardware	Tether	Ethernet CAT6	1	\$18.00	\$18.00	
Re-used	Indirect Material	Hardware	Tether Cover	Braided Sleeve	1	\$23.00	\$23.00	
Purchased	Direct Material	Electronics	IMU Sensor	MPU6050	1	\$4.00	\$4.00	
Purchased	Direct Material	Electronics	Temprature Humedity Sensor	DHT-11	8	\$1.50	\$12.00	
Purchased	Direct Material	Electronics	Water Depth Sensor	MSS540C	1	\$12.00	\$12.00	
Re-used	Direct Material	Electronics	Fuse	Protection (30A)	1	\$2.00	\$2.00	
Purchased	Direct Material	Material	Camera Housing	Stainless Steel	8	\$3.00	\$24.00	
Purchased	Direct Material	Material	Gripper	Artelon	2	\$8.00	\$16.00	
Purchased	Direct Material	Material	Box	Stainless Steel	1	\$80.00	\$80.00	
Purchased	Direct Material	Material	Frame	Stainless Steel	1	\$20.00	\$20.00	
Purchased	Indirect Material	Material	Gasket	Silicon	1	\$27.00	\$27.00	
Purchased	Indirect Material	Material	Bolts & Nuts	Stainless Steel	92	\$0.50	\$46.00	
Purchased	Indirect Material	Hardware	Gland	Sealing	28	\$1.05	\$29.40	
Purchased	Direct Material	Hardware	O-Rings	Sealing	50	\$1.00	\$50.00	
Re-used	Direct Material	Hardware	T200	Thruster	6	\$206.00	\$1236.00	
Re-used	Direct Material	Hardware	Tether	PU Hose 6mm	1	\$6.00	\$6.00	
Purchased	Indirect Material	Hardware	Solenoid Valve	12V	2	\$7.00	\$14.00	
Re-used	Indirect Material	Hardware	Pneumatic Piston	Double Acting	2	\$13.50	\$27.00	
Re-used	Indirect Material	Hardware	Compressor	20 Liter	1	\$50.00	\$50.00	
Purchased	Direct Labors	Fabrication	Welding	-	1	\$90.00	\$90.00	
Purchased	Direct Labors	Fabrication	Machining	-	1	\$60.00	\$60.00	
Purchased	Direct Labors	Fabrication	CNC Cutting	-	1	\$150.00	\$150.00	
Total Product Costs Invested In ROV Vehicle							\$2820.90	
Re-used	Direct Material	Hardware	Surface Control Unit	Briefcase	1	\$75.00	\$75.00	
Re-used	Direct Material	Hardware	Adapters	Powering Arduino, Switch, NVR	3	\$2.00	\$6.00	
Purchased	Direct Material	Electronics	USB Host Shield	Controller Interfacing	1	\$6.50	\$6.50	
Re-used	Direct Material	Electronics	Power Supply	48V 31.3A Mean Well	1	\$6.50	\$6.50	
Re-used	Indirect Material	Electronics	Anderson Connector	Power Connector	1	\$40.00	\$40.00	
Re-used	Direct Material	Electronics	Ethernet Switch	5 port-switch	1	\$6.00	\$6.00	
Purchased	Direct Material	Electronics	Power Cable	AC Power	2	\$6.00	\$12.00	
Purchased	Direct Material	Electronics	NVR	8 Channel	1	\$86.00	\$86.00	
Re-used	Indirect Material	Electronics	LCD 4x20	Character LCD	1	\$7.00	\$7.00	
Purchased	Direct Material	Electronics	LCD Screen	17 inch	1	\$30.00	\$30.00	
							\$275.00	
Purchased	-	Other	Competition Registration Fees	-	1	\$300.00	\$300.00	
Purchased	Rents	Other	Pool Rent	-	1	\$200.00	\$200.00	
Purchased	Rents	Other	Workplace Rent	-	1	\$200.00	\$200.00	
Purchased	Other	Other	Printing T-shirts	-	15	\$10.00	\$150.00	
Total Period Costs Invested							\$850.00	
Total Expenses							\$3,945.90	
Total Expenses without resused Components							\$1,833.00	

Net Cost Of ROV Vehicle

Product Costs

Electrical System

Mechanical System

Services

Product Costs

Tether Control Unit

Period Costs

Extra